Digital and More Lethal
The 21st Century Battery

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Due to the increased lethality and battlespace of the Force XXI maneuver brigade, the direct support (DS) artillery batteries had to become more lethal and more situationally aware of the brigade's battlespace. The new Force XXI Paladin battery table of organization and equipment (TOE) and digital devices have enhanced the battery's warfighting capability, not only making it digital, but more lethal as well.

A 3x6 TOE (three batteries per battalion, each battery with two firing platoons of three guns) replaced the 3x8 TOE. In the new TOE, the two firing platoon fire direction centers (FDCs) were replaced by one battery FDC and one battery operations center (BOC). With these changes, came the addition of a support platoon with a platoon leader and sergeant. And instead of two gunnery sergeants (one per firing platoon), the battery now has one.

Each of these TOE changes individually makes little difference in battery operations, but taken collectively, the battery had to change its tactics, techniques and procedures (TTP) to survive on the modern, expanded battlefield.

This article addresses how the new TOE coupled with the new digital devices of Force XXI change the way Paladin batteries fight in the Army, based on our experiences in the 4th Infantry Division (Mechanized), Fort Hood, Texas—the first division to be digitized. We do not pretend to have all the answers for Paladin operations, only suggestions for TTP to help units that will be digitized in the future. The TTP in this article are the results of lessons learned in the past year of training, to include a digitized rotation at the National Training Center (NTC), Fort Irwin, California, and a Force XXI battle command, brigade and below (FBCB[2]) customer user's test (April-June 00).

BOC/FDC Operations. At first, the loss of one FDC per firing platoon caused difficulties. The lack of redundancy in battery internal fire direction forced the battery to rely on sister batteries when transferring guns or when equipment malfunctioned. With the addition of the BOC, the battery now can transfer the howitzers within the battery.

However, the BOC is not present merely for redundancy in fire direction; its primary function is to serve as the central location for the battery's command and control. The BOC is the information conduit that connects the howitzers to the battery's combat trains and the battery to the battalion. It is the logistical hub that not only tracks the battle, but also tracks maintenance and ammunition resupply triggers and requests.

The BOC is not one identifiable vehicle, but a group of several. The center of the group is the M1068 command post vehicle, replacing the old M577. This tracked vehicle is identical in equipment to the battery FDC; the only difference is manning. BOC personnel are 13E Fire Direction Specialists; the support platoon leader (who also serves as the battery executive officer) and support platoon sergeant; the nuclear, biological, chemical (NBC) NCO; and the attached communications NCO. The support platoon leader's/sergeant's high-mobility multipurpose wheeled vehicles (HMMWVs) are also part of the BOC. This configuration helps command and control the battery combat trains.

The responsibilities of the BOC are similar to those of the battalion tactical operations center (TOC). (See Figure 1 on Page 14.) Along with these duties, the BOC also must conduct information management similar to the battery FDC. The BOC updates and maintains the information in Figure 2 on Page 14.

With the addition of the support platoon leader and sergeant, the battery commander does not have to be heavily involved in battle and logistical tracking. He can obtain critical information from his BOC without engaging in the cumbersome task of detailed battle tracking. That frees the battery commander to move to the "point of penetration"—to position himself and his attention on the battlefield where he can best influence the fight.

Figure 1: Duties of the Battery Operations Center (BOC) Similar to the Duties of Battalion Tactical Operations Center (TOC)

Manning Challenges. Along with the advantages of the new TOE come some disadvantages. One battery FDC means that the majority of the battery's 13Es are located there. To provide a viable redundancy in battery fire direction, the BOC must be manned with at least two 13Es. One must be an advanced Field Artillery tactical data system (AFATDS)-battery computer system (BCS) operator and the other a 13E20 to ensure the BOC has the technical expertise to conduct fire missions in the absence of the FDC.

When the battery's howitzers are transferred to the BOC, the support platoon leader acts as the battery fire direction officer (FDO) and the BOC's 13E20 acts as the battery's fire direction NCO, thus allowing the battery to continue to fight even after losing its FDC. The BOC is not as robust in fire direction personnel and does not have the depth to continue as the battery FDC for extended periods. To ensure the BOC is capable of receiving the howitzers from the FDC, the BOC must update its AFATDS and BCS databases in conjunction with the FDC. The BOC also must maintain the current fire support coordinating measures (FSCMs).

Another disadvantage of the new TOE is having only one gunnery sergeant. Because of the increased battlespace of the Force XXI brigade, the battlespace of the Paladin battery also has increased. The artillery position areas (PAs) have been replaced with Paladin axes of advance (PAAs) during offensive operations. The land that a Paladin battery used to occupy has now doubled, if not tripled.

This is a large area for one gunnery sergeant to reconnoiter. He quickly can become overwhelmed if the PAAs aren't managed properly and if the full capability of the battery's Force XXI FBCB² isn't fully implemented.

Battery Digital Systems. The digital systems of the battery separate it from

- Battery Database:
  - Center of Fire Area Grids
  - Left, Right and Center Sectors
  - Minimum and Maximum Elevations
  - Muzzle Velocity Variations
  - Registrations
- Ammunitions Status
- Battery Mission Statement
- Battery Essential Field Artillery Tasks (EFATs)
- Situation Map:
  - Fire Support Coordinating Measures (FSCM)
  - Combat/Field Trains
  - Friendly Units (At Least All Brigade Elements with Company-Sized Icons)
  - Enemy Locations (Platoon or Larger Elements)
  - Nuclear, Biological and Chemical (NBC) Hazardous Areas

Figure 2: Information the BOC Updates

other conventional batteries: FBCB² and AFATDS' new technical fire direction software. FBCB² has done more to increase the battery's warfighting capabilities and lethality than any other change. Figure 3 shows the vehicles/battery personnel who have FBCB².

- *FBCB²*. This is the battle command information display system that provides on-the-move, real-time command and control information. FBCB² supports situational awareness (SA) down to the section level by showing the user his location, the location of other friendly forces, observed enemy forces and all known battlefield obstacles.

The enhanced position location reporting system (EPLRS) data radio transmits and receives digital information between vehicles. This allows FBCB² to automatically update and keep the SA current. The networked EPLRS also allows for extended communications as a message processes through the spider web of servers to its destination.

Battery Operations Orders. The TTP for FBCB² are divided into two categories: planning and preparation before the battle and execution during the battle. In the first category, the battery leadership uses FBCB² in its troop-leading procedures to decrease the time it takes to plan for the battle—which increases the time the section chiefs and soldiers have to prepare for the fight. Using the FBCB², a battery commander can send a warning order (WARNO) immediately after receiving the battalion operations order (OPORD) without leaving the battalion TOC. The battery commander can build battery graphics immediately, based on FBCB² battalion graphics, and disseminate them down to the Paladin section chief level.

The dissemination of timely information negates the need for the battery commander to return to his battery, gather the battery leadership and issue guidance. Before FBCB², if the commander wanted to issue a WARNO (without gathering his leaders in one location), he had to give the information over the radio, which often resulted in confusion and misunderstanding. With the FBCB², he can issue guidance in real time.

Reconnaissance Operations. FBCB² also facilitates reconnaissance operations. When the gunnery sergeant maneuvers forward attached to the trail maneuver company, the battery is better able to track and follow his movements. The gunnery sergeant also can input the exact route the battery needs to follow to get to

Figure 3: Battery Personnel/Vehicles Equipped with Force XXI Battle Command, Brigade and Below (FBCB²)

the new location. This is extremely important, especially during the deliberate attack that involves breaching operations. The gunnery sergeant or any battery leader who is forward can transmit the route via the FBCB² in real time.

Land Management. One of the problems with the expanded battlefield is the fact that the division and corps need to position their assets forward within the brigade's area of operations, thus making land management an even greater problem than before. The FBCB²'s SA function alleviates many of the challenges associated with land management. This function facilitates battery reconnaissance efforts focused on land deconfliction. Also it allows the battery commander to send free-text messages to maneuver company commanders around the battery without having to obtain nets, call signs or locations.

Situational Awareness. Along with friendly SA information, FBCB² provides enemy SA information. An observer can add enemy icons to the display, whether the observer is part of a Striker team or a brigade ambulance outfitted with FBCB²; any FBCB² platform can add an enemy icon to the network. This information is posted immediately on all FBCB² platforms in the brigade, which allows the battery leadership to see the latest enemy situation and adjust battery operations.

Logistical Reports. Report formats are another advantage of FBCB² that can be used both in planning and execution. These reports include the logistical status (LOGSTAT) that rolls up the brigade's on-hand quantities of all classes of supply and the personnel status (PERSTAT) that rolls up the brigade's personnel on-hand.

These reports allow the battery to send supply and ammunition requests both before and during battle. The battalion and brigade send reports to the battery to ensure it is situationally aware of the logistical picture throughout the brigade.

Extended Communication Range. An additional facet of FBCB² is its ability to pass information at greater ranges than the single-channel ground and airborne radio system (SINCGARS). Once a report is sent, it relays through any platform with an EPLRS, thus extending the range of the battery's communications. The commander's and platoon leaders' vehicles are the only FBCB² platforms with EPLRS. As long as one platform is active, the FBCB² message can be relayed. This facilitates communications between the battery and gunnery sergeant when he is forward with the maneuver element and out of range.

SA for the Section Chief. The greatest advantage of FBCB² is the capabilities it brings to the Paladin section chief. He has SA and can follow a route the gunnery sergeant or battery commander puts on a screen instead of on a lamented map. The section chief can use the screen to navigate to his next position without having to be guided by another howitzer or a platoon leader.

Finally the section chief, for the first time, immediately can access all graphics, WARNOs, fragmentary orders (FRAGOs) and real-time SA information to facilitate his section's operations and accomplish fire missions.

• *AFATDS Technical Fire Direction Software.* Once this software upgrade is fielded, the AFATDS in the FDC/BOC will need only one computer operator (AFATDS) instead of two (BCS and AFATDS). This lowers the requirement for personnel to man the FDC and BOC.

The new software also will decrease fire mission processing times because the fire mission no longer will have to be transferred from AFATDS to BCS.

The AFATDS software will allow the FDC/BOC to fire up to 12 howitzers at a time instead of just eight in BCS. This increases the FDC's handover capability; no longer will guns have to be paired or a battery split between one of the other two batteries.

• *Training Limitations.* With all new equipment come some limitations that only extended use and training can identify. We fielded the AFATDS technical fire direction software in December.

Due to the relative newness of FBCB², the only limitations we have identified

are related to training. We anticipate there will be training challenges associated with the new AFATDS software similar to those for FBCB².

Because of the typical turnover rate in the battery, new personnel constantly have to be trained on FBCB². The battery is forced to train personnel with little outside support. One fix is to include FBCB² training in the basic NCO course (BNCOC), the advanced NCO course (ANCOC) and officer basic course (OBC). Additionally, an FBCB²-specific course can be implemented at units equipped with the system to ensure incoming personnel are trained properly.

Another running challenge is the training required for the constant upgrades to the system's software. The fix, which has been implemented in the 4th Infantry Division Artillery, is a proactive training program that ensures key personnel are trained before the upgrade is issued throughout the division artillery.

The digitized battery of the future promises increased situational awareness down to the section level, more effective command and control, and redundancy in fire direction. The Paladin battery's warfighting capabilities are increasing to provide the Force XXI brigade more rapid, lethal fires.
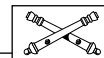
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